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DYNAMIC UMBILICALS WITH INTERNAL STEEL RODS

ABSTRACT OF THE DISCLOSURE

In an umbilical, one or more steel rods, which provide strength and ballast, are wound helically within the umbilical along with the steel tubes and/or elongated active umbilical elements. These steel rods replace some or all of the thermoplastic filler elements that would otherwise be included within the umbilical. An umbilical according to an embodiment of the invention may <sup>include</sup> ~~comprise~~ a plurality of steel tubes helically wound around a core, and at least one substantially solid steel rod helically wound around the core, the steel rod being arranged in a void between the steel tubes. Thus, the invention avoids the need to apply additional armoring layers to the outside of the umbilical for strength and ballast.

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